Unclassified

SECURITY CLASSIFICATION OF THIS PAGE *(When Data Entered)*

REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

1. REPORT NUMBER: APRO 84-13

2. GOVT ACCESSION NO.:

3. RECIPIENT'S CATALOG NUMBER:

4. TITLE *(and Subtitle)*: Feasibility of Application of Competition Decision - Assist Package (CDAP) to Spare Parts

5. TYPE OF REPORT & PERIOD COVERED: Final

6. PERFORMING ORG. REPORT NUMBER:

7. AUTHOR(s): V. Gail Lankford; Brenda L. Stewart

8. CONTRACT OR GRANT NUMBER(s):

9. PERFORMING ORGANIZATION NAME AND ADDRESS: Office of the Deputy Chief of Staff for Logistics, ATTN: DALO-PRO, Fort Lee, VA 23801-6045

10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS:

11. CONTROLLING OFFICE NAME AND ADDRESS: Army Materiel Command, ATTN: AMCPP-SP, 5001 Eisenhower Avenue, Alexandria, VA 22333

12. REPORT DATE: January 1985

13. NUMBER OF PAGES: 45

14. MONITORING AGENCY NAME & ADDRESS *(if different from Controlling Office)*:

15. SECURITY CLASS. *(of this report)*: Unclassified

15e. DECLASSIFICATION/DOWNGRADING SCHEDULE:

16. DISTRIBUTION STATEMENT *(of this Report)*: Unlimited

17. DISTRIBUTION STATEMENT *(of the abstract entered in Block 20, if different from Report)*:

18. SUPPLEMENTARY NOTES:

19. KEY WORDS *(Continue on reverse side if necessary and identify by block number)*:

Active Army
Logistics
Spare Parts
Competition
Breakout
Procurement
Cost Effectivness
Computer Program

20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*:

While the CDAP model may be useful for some major assemblies/subassemblies where an extensive manpower effort for developing model input is warranted, it is impractical as a general purpose economic analysis model for spare parts breakout or competition. A system to collect auditable cost and benefit data appropriate to each Major Subordinate Command (MSC) to support the breakout decision should be developed. Then, an appropriate economic analysis model should be employed for spare parts breakout analyses pursuant

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE *(When Data Entered)*

to DAR Supplement 6 full-screening procedures. A subjective analysis of the noneconomic benefits of breakout and competition is recommended as part of the basis for the breakout decision.

ADA 154 716

APRO 84-13
FINAL

APRO

FEASIBILITY OF APPLICATION

OF

COMPETITION DECISION-ASSIST PACKAGE (CDAP)

TO

SPARE PARTS

JANUARY 1985

ARMY PROCUREMENT RESEARCH OFFICE
OFFICE OF DEPUTY CHIEF OF STAFF FOR LOGISTICS
FORT LEE, VIRGINIA 23801-6045

APRO 84-13

FINAL

FEASIBILITY OF APPLICATION OF COMPETITION DECISION-ASSIST PACKAGE (CDAP) TO SPARE PARTS

by

V. Gail Lankford

Brenda L. Stewart

JANUARY 1985

The pronouns "he," his," and "him;" when used in this publication represent both the masculine and feminine genders unless otherwise specifically stated.

Information and data contained in this document are based on input available at time of preparation. Because the results may be subject to change, this document should not be construed to represent the official position of the United States Army.

APPROVED FOR PUBLIC RELEASE; DISTRIBUTION UNLIMITED

ARMY PROCUREMENT RESEARCH OFFICE
Office of Deputy Chief of Staff for Logistics
Fort Lee, Virginia 23801-6045

EXECUTIVE SUMMARY

A. BACKGROUND. Defense Acquisition Regulation (DAR) Supplement No. 6, DoD Replenishment Parts Breakout Program, 1 June 1983, prescribes a screening of replenishment parts designed to reduce costs by breaking out parts for purchase from other than prime weapon system contractors. The US Army Audit Agency (USAAA) recommended that a cost model be constructed and implemented to (a) estimate potential costs and price reductions attributable to breakout or increased competition, (b) compare the two figures, and (c) identify whether breakout or competition is cost effective. In September 1983, the Army Procurement Research Office (APRO) published the Competition Decision- Assist Package (CDAP), APRO Study Report 82-08, which described an automated model designed to calculate estimates of recurring costs associated with two producers involved in a competitive production effort. This model had been developed as a tool to assist in the economic evaluation of production competition for a major weapon system.

B. STUDY OBJECTIVE. The objective of this study was to determine if it is feasible and beneficial to modify the existing CDAP model so it can be applied to spare parts breakout or competition as an economic analysis model.

C. STUDY APPROACH. Information was collected from studies and other literature pertaining to breakout and competition of spare parts, and from interviews with personnel who are involved with spare parts acquisitions. DAR Supplement 6 and limited documentation for the Commodity Command Standard System (CCSS) were also reviewed. Finally, the information collected during the literature review and interviews was synthesized to determine if the CDAP model is a reasonable candidate for a general purpose economic analysis model for spare parts breakout or competition.

D. CONCLUSIONS. While the CDAP model may be useful for some major assemblies/subassemblies where an extensive manpower effort for developing model input is warranted, it is impractical as a general purpose economic analysis model for spare parts breakout or competition. Other, more appropriate models exist. However, auditable data to support the breakout analyses are scarce.

E. RECOMMENDATIONS. A system to collect auditable cost and benefit data appropriate to each Major Subordinate Command (MSC) to support the breakout decision should be developed. Then, an appropriate economic analysis model should be employed for spare parts breakout analyses pursuant to DAR Supplement 6 full-screening procedures. The model should include the capability for present-value analysis. Consideration should be given to expanding the basis for the breakout decision to include a subjective analysis of the noneconomic benefits of breakout or competition. More extensive sharing of ideas, information, emerging methodologies and technologies pertaining to the costs, benefits and risks of breakout of spare parts among MSC's, military departments, and defense agencies is also recommended.

TABLE OF CONTENTS

TABLE OF CONTENTS (CONT'D)

LIST OF FIGURES

CHAPTER I

INTRODUCTION

A. BACKGROUND

Weapons systems and their associated equipment are composed of thousands of parts and subassemblies. Spare parts are purchased to repair or replace those parts or subassemblies that break, malfunction, or wear out, in order to restore the end item or system to full operation. Spare parts are spares and repair parts, reparable and consumable, purchased for use in the maintenance, overhaul, and repair of equipment such as ships, tanks, guns, aircraft, missiles, ground communication and electronic systems, ground support and associated test equipment. They include items, spares, repair parts, parts, subassemblies, components, and subsystems, but exclude end items such as aircraft, ships, tanks, guns, and missiles. The Army manages over 360,000 spare parts. These items are essential for keeping our weapons systems operational.

A significant portion of the Department of the Army budget is for acquisition of these required spare parts. Approximately $22 billion was budgeted for spare parts for DoD in FY 84, with $6.2 billion of that total allocated to the Army.[21:xiii,15]

Periodically, DoD's stewardship of the funds entrusted to it for procurement of spare parts has been seriously questioned. There were Congressional hearings in the fifties and again in the sixties when Congressman Pike raised the pricing issue. Beginning again in 1981, a series of

reports, studies, audits, and investigations associated with the acquisition of spare parts led to much publicity and high visibility of what appeared to be intolerable excesses in the prices paid for some spare parts. A need for additional management attention was indicated, and an intensive effort was initiated by the Office of the Secretary of Defense and the Department of the Army in an attempt to curb pricing abuses.

In July 1983, the Secretary of Defense initiated a ten-point program to ensure DoD and the Services would not be plagued with pricing abuses in the future. The main elements of the plan included employee rewards for rigorous pursuit of cost savings, improved competition and the use of competition advocates, refusal to pay unjustified price increases, reform of basic contract procedures, refunds of overcharges, and increased audits and investigations of spare parts acquisitions.[34]

In August 1983, the Secretary of Defense issued a follow-on Memorandum directing twenty-five additional short-, medium-, and long-term actions to eliminate spare parts pricing abuses. Among the major short-term actions was the Secretary's directive to accelerate plans for the acquisition of computer hardware and software to assist parts control personnel, and added emphasis on value engineering, breakout, and the implementation of the DoD Replenishment Spare Parts Breakout Program.[33]

Each of the military departments instituted its own spare parts management reform initiatives. The Army's reform program began in April 1983, with the formation of a "quick-look" team whose work confirmed the Army had many of the same systemic problems as the other Services. The US Army Materiel Development and Readiness Command (DARCOM), now the US Army Materiel Command (AMC), organized a special task force to study the issues raised by the

"quick-look" team and published the Spare Parts Review Initiatives (SPRINT) program which contained eight major initiatives. A Program Manager (PM) for Spares office was established at each of AMC's Major Subordinate Commands (MSC) as one sub-initiative, and the Army Logistics Management Center developed a Spare Parts Management Course as another.

The Office of Federal Procurement Policy (OFPP) performed an independent review of Defense Department spare parts management reforms. Five study teams -- one for each of the Services and the Defense Logistics Agency -- were established in late January 1984. DoD and several civilian agencies furnished over 30 persons for these teams and a team support group. OFPP collected over 300 audit reports, hearing records, directives, studies and memoranda dealing with spare parts. The teams reviewed these documents and visited over 70 government and contractor facilities. Collectively, the teams spent over 3,000 staff days on the study. The comprehensive report, submitted to the Congress 1 June 1984, concluded: "In the near term, the most difficult aspect of the program is the implementation of a cost-effective breakout program."[21:xv]

One part of the Defense Secretary's ten-point program was to direct the Defense Inspector General to conduct an audit of every major buying agency in the DoD to determine the effect of the recent management reforms in solving the systemic spare parts problems. The US Army Audit Agency (USAAA) performed that audit of the Army's sole major buying agency, AMC. The auditors' report stated the Command did not have a cost model that would estimate the additional costs associated with breakout or competition.* While

*Breakout results in acquiring from the actual manufacturer a part that had previously been acquired from the prime, or acquiring competitively a part that had previously been acquired noncompetitively. Thus, competition is both a goal and a potential result of breakout.

generally lower prices for spare parts are expected from breakout or competition, it was believed there would be situations in which those price reductions would be more than offset by increases in other costs such as administrative and inspection costs. The report further stated that "a model should be prepared and incorporated in the overall acquisition system, perhaps into the automated part of the system, to identify and stop breakout or competitive actions having the potential to increase overall costs to acquire parts."[29:20] Recommendation B-2 of the Audit Report recommended the construction and implementation of a cost model to (a) estimate potential costs and price reductions attributable to breakout or increased competition, (b) compare the two figures, and (c) identify whether breakout or competition is cost effective. AMC agreed with the finding, stating that potential offset costs and price reductions should be considered before the the decision is made to code a part for full competition or acquisition from the actual manufacturer.[29:21]

In September 1983, the Army Procurement Research Office (APRO) published the Competition Decision-Assist Package (CDAP), APRO Study Report 82-08, which described an automated model designed to calculate estimates of recurring costs associated with two producers involved in a competitive production effort.[35:A-2] This model had been developed as a tool to assist in the economic evaluation of production competition for a major weapon system. AMC tasked APRO to evaluate the model's applicability to the spare parts problem identified in the USAAA Audit Report.

B. STUDY OBJECTIVE

The objective of this study was to determine if it is feasible and

beneficial to modify the CDAP model so it can be applied to spare parts breakout or competition as an economic analysis model.

C. STUDY APPROACH

Studies and other literature pertaining to costs incurred and savings realized from breakout and competition of spare parts were reviewed. These studies encompassed works from all the military services. Regulations dealing with spare parts breakout were scrutinized. Existing spare parts economic analysis processes and models which could be located were reviewed to provide a base for assessing the feasibility of using a modified CDAP model for that purpose. The study team interviewed knowledgeable personnel who are involved with various phases of spare parts acquisition including requirements, spare parts pricing, breakout, production engineering, cost analysis, technical data storage and retrieval, and policy and compliance. Limited documentation for the Commodity Command Standard System (CCSS) was reviewed. Finally, the information collected during the literature review, meetings, and interviews was synthesized to determine if the CDAP model is a reasonable candidate for a general purpose economic analysis model for spare parts breakout or competition.

D. SCOPE

This research project is a feasibility study and is limited to determining the feasibility of modifying the CDAP model for application to replenishment spare parts subject to the DoD Replenishment Parts Breakout Program.

E. ORGANIZATION OF REPORT

Chapter II discusses the DoD Replenishment Parts Breakout Program. Application of CDAP and other models and automation to spare parts breakout or competition is addressed in Chapter III, while Chapter IV is dedicated to

the study conclusions and recommendations. The appendices contain Acquisition Method Codes and Acquisition Method Suffix Codes from DAR Supplement No. 6 along with the format of the DoD Replenishment Parts Acquisition Report.

CHAPTER II

DOD REPLENISHMENT PARTS BREAKOUT PROGRAM

A. PROGRAM OBJECTIVE

Defense Acquisition Regulation (DAR) Supplement No. 6, DoD Replenishment Parts Breakout Program, 1 June 1983, states the objective of the program "is to reduce costs by 'breakout' of parts for purchase from other than prime weapon system contractors while maintaining the integrity of the systems and equipment in which the parts are to be used."[9:S6-1] Breakout is defined by DAR Supplement No. 6 as "the improvement of the acquisition status of a part resulting from deliberate management decisions."[9:S6-2] This improvement can be accomplished either by competitively acquiring a part previously purchased noncompetitively or by acquiring a part directly from the actual manufacturer when it was previously purchased from a prime contractor who is not the actual manufacturer of the part.

B. BACKGROUND

On 30 October 1964, the Assistant Secretary of Defense (Installations and Logistics) published the High Dollar Spare Parts Breakout Program and required that it be distributed to personnel in all DoD activities concerned with provisioning and procurement of spares and repair parts. The program was designed in cooperation with the Departments of the Army, Navy, Air Force, and Defense Supply Agency, now the Defense Logistics Agency (DLA), to identify and screen at the earliest possible time those spares and repair parts that accounted for the preponderance of spare parts procurement dollars. The screening was done to determine the potential for breakout

to competition or purchase directly from the parts manufacturers. The March 1969 version of the High Dollar Spare Parts Breakout Program was replaced by DAR Supplement No. 6, DoD Replenishment Parts Breakout Program.

C. REQUIREMENTS

The military departments and the defense agencies are required to follow the policies and procedures of DAR Supplement No. 6 for acquisition of any centrally-managed replenishment part for military systems and equipment. The Supplement does not apply to component breakout, parts in provisioning, parts being acquired under other specifically defined initial support programs or parts acquired through local purchase. The program requires DoD personnel to apply sound management and engineering judgement to determine the feasibility of using competitive acquisition procedures or purchasing directly from the manufacturer and to overcome obstacles to breakout. The Supplement also includes a requirement to provide opportunities for small and disadvantaged businesses to supply parts. There are, of course, additional requirements imposed on acquisition personnel to advance other socio-economic goals. As reported by the Commission on Government Procurement:

> Government contracts have been used to serve many interests and beneficiaries other than the contractor, to wit, big business, small business, materialmen, laborers, consumers, every race, color, creed, origin, sex, the old, the young, apprentices, prisoners, the blind, animals, safety, health, distressed areas, hardcore areas, disadvantaged enterprises, gold flow, the environment, the technological base, the production base, and geographical distribution.[3:14]

The requirements of DAR Supplement 6 for breakout coding and identification, selection and screening of parts will be summarized in the paragraphs that follow.

1. Breakout Coding. Three kinds of codes are used in the breakout program.

a. Acquisition Method Codes (AMC's). These single-digit numeric codes are used to describe the results of the screening process by specifying whether the item will now be suitable for competitive acquisition or purchase directly from the manufacturer, or whether it must still be acquired from the prime contractor who is not the manufacturer. The AMC's are listed and defined in Appendix A.

b. Acquisition Method Suffix Codes (AMSC's). These codes are designed to provide additional information about the AMC. These single-digit alphabetic codes will alert personnel to reasons for assignment of the AMC's. For example, AMSC Y indicates that a part has an unstable design. That gives personnel some background on the reason the part is being acquired only from the present source. AMSC's are listed and defined in Appendix B.

c. Contractor Technical Information Codes (CTIC's). Because the Supplement allows only DoD activities to assign AMC's and AMSC's, contractor's technical information must be designated by CTIC's. Whenever DoD activities require technical information from contractors to make an informed coding decision, they contract for that information as prescribed in Part 4 of DAR Supplement 6. The definitions of these two-digit alphabetic codes parallel those of the AMSC's for the most part.

AMC's are assigned by the DoD component which introduces into the inventory the equipment or system for which the parts are needed. The code assigned initially is always subject to change although individual circumstances will affect the likelihood of a change. Advancing technology and passing time both provide opportunities for improvement of the acquisition

status. New technology may overcome a present constraint, and a contractor's interest in protecting his rights in certain data may abate with time. The assigned codes are communicated through the Federal Catalog Program formats, communication media and operating instructions, as augmented by DAR Supplement 6.

2. Identification, Selection and Screening of Parts.

a. Identification and Selection. Parts are identified and selected for screening by reference to several lists developed by individual DoD components.

(1) Lists of new parts entering the inventory system such as provisioning lists.

(2) Lists of all parts forecasted for acquisition during the subsequent 12-month period when the annual buy value exceeds $10,000 (except those already suitable for competitive procurement).

(3) Immediate buy requirements with a value exceeding $10,000 and no current AMC/AMSC.

(4) Items with an AMC/AMSC suspected to be inaccurate.

b. Screening. DAR Supplement 6 provides step-by-step screening procedures for both full and limited screening of spare parts. These procedures provide for relevant facts pertaining to breakout decisions to be considered and recorded. Because circumstances vary, the steps may not be followed precisely for each item screened. Responsible judgement must be applied to reviewing all elements to insure that all relevant facts are identified and considered. Justification of the decision and the results of all screening efforts are required to be recorded in a file for each part screened.

(1) Full Screening. There are 65 steps in the full-screening process. These steps are divided into six phases:

(a) Data Collection Phase. For each part, all available data are assembled. Identification data from industry and contracting and technical history are sought, e.g., all known sources, past awards and related information, annual demand, and expected life in the military supply system.

(b) Data Evaluation Phase. In this phase the adequacy of the technical data package is determined, and the Government's right to use the data for reprocurement purposes is investigated. If additional work is required to develop an adequate technical data package, the time required to do so is estimated. This estimate will be considered when deciding whether breakout is feasible during this review or if it can be accomplished profitably during the remainder of the weapon system's life.

(c) Data Completion Phase. DAR Supplement 6 recommends this time-consuming phase be accomplished concurrently with other phases of the review to minimize total screening time. Whatever information is required to assess the adequacy of the technical data package and the extent of the Government's rights in the data is located. At the beginning of this phase there are four categories into which the part being screened will fit:

i) Data package is complete. Government has full rights to use it for acquisition.

ii) Government has full rights to use existing data; however, data package is incomplete. Missing elements can probably be supplied.

iii) Data package is complete but full Government rights to use data have not been determined.

iv) Part requires further research to establish adequacy of data and status of the Government's rights to data. Restrictive legends on drawings and data are challenged if appropriate. Also, in this phase, the decision on purchase of unlimited rights in data is made.

(d) Technical Evaluation Phase. During this phase of the screening process, the technical judgement of the feasibility of breaking out the part is delivered. The 16 steps in this phase cover factors such as the design stability and critical characteristics of the item relating to personnel and equipment safety. The requirements for quality assurance provisions and special testing are assessed during this part of the review.

(e) Economic Evaluation Phase. Generally accepted management principles require a systematic determination that expected benefits exceed expected costs. The basis for the decision to break out parts for competitive procurement or direct purchase from the manufacturer is also an economic one. The steps designed to identify and estimate breakout savings and direct cost offsets to breakout are summarized below:

i) Developing Savings Data. The savings from breakout are computed by applying the savings factor, e.g., 25%, to the value of items expected to be purchased over the remaining life of the weapon system. DAR Supplement 6 provides the option of using a savings factor of 25% or a factor developed locally which more accurately reflects local conditions and experience.

ii) Computing Breakout Costs. The groups of costs considered in the DAR Supplement 6 economic evaluation are identified below:

1 Direct Costs. Expenditures that are not reflected in the unit price of the part and which can be totally identified to a specific, successful breakout action are included in this category. Government tooling or special test equipment, quality control expenses and costs to the Government for purchasing rights in data are examples of direct costs.

2 Performance Specifications Costs. There are costs associated with the decision to open an item to competition by writing a performance specification which do not arise when a design specification is used. With the performance specification the cost of introducing an unknown number of non-stocked parts into the inventory is a significant consideration. Each reprocurement may bring another flood of non-stocked parts that must be stocked by the supply system for repair to weapons systems. The following costs have been identified:

a Additional catalog costs

b Additional bin opening costs

c Additional management costs

d Additional technical data costs

e Additional repair tools and test equipment costs.

(iii) Comparing Savings and Costs. Estimated breakout costs are compared to expected breakout savings. When estimated breakout costs exceed expected savings and the part is constructed to a performance specification, the option of converting to a design specification is explored. If obtaining a design specification package is expected to be cost beneficial, a temporary AMC is assigned, pending acquisition of the

design specification package. The appropriate AMC is assigned at this point in the analysis. All parts coded AMC 2 (suitable for competitive acquisition for the first time) are then subjected to an additional screening phase.

(f) Supply Feedback Phase. The additional time required to break out the parts coded AMC 2 is estimated. If the required contract date can still be met, the part is coded competitive, and action to qualify additional sources begins. If the required contract date cannot be met and the inventory manager cannot accept later delivery, the records are annotated for competitive acquisition of the next requirement and the current requirement is acquired under the existing AMC.

(2) Limited Screening. When full screening cannot be accomplished in time to support an immediate requirement, limited screening procedures are used. Only the essential points of data and technical evaluations are examined in the 11-step limited screening process. The technical data package is reviewed for sufficiency, accuracy and legibility. Stability of design, use of special equipment, and quality assurance requirements are considered. When limited screening does not yield a competitive AMC, full screening procedures are prescribed if the annual buy forecast reflects a high buy value and high buy quantity. The terms "high buy value" and "high buy quantity" are not defined in DAR Supplement 6 but are used in connection with parts whose annual buy value is forecast to exceed $10,000.

3. Reporting System.

A cumulative report of actions covered by the breakout program but not available from data in the Federal Catalog Program must be maintained by

each Department on a quarterly basis. The reports are submitted at mid-year and year-end to the Under Secretary of Defense (Research and Engineering), ATTN: Deputy Under Secretary for Acquisition Management. The data reported consist of the number of parts and dollars purchased in each of the five AMC categories and are grouped according to major commodity categories such as airframe structural components and vehicle components and related parts. The report format is shown in Appendix C.

CHAPTER III

APPLICATION OF MODELS AND AUTOMATION TO SPARE PARTS BREAKOUT

A. ECONOMIC ANALYSIS MODELS

1. Competition Decision Assist Package (CDAP) Model.

a. Background. Regulations governing the Army's acquisition of weapons systems and other materiel require the use of competition whenever feasible. Competition, by its nature, generates economy, efficiency, and innovation. However, competition is not always an absolute good in Army acquisitions. It not only is not always possible but may even result in increased risks and costs. While competition is generally desirable for the production of weapons, it must be evaluated on a case-by-case basis. The CDAP model was developed to assist analysts in the recurring unit production cost portion of the economic analysis for a major Army weapon system. Guidance for assessing the noneconomic considerations for competition, as well as the nonrecurring elements of the economic analysis, was not included in the automated model but was published in APRO Study Report 82-08, Competition Decision-Assist Package (CDAP)[35] and AMC Pamphlet 715-9. A User's Guide to the model was published in APRO Study Report 84-09[15], and was also included in the AMC Pamphlet.

b. Overview of CDAP Model. The CDAP computer simulation has been designed to calculate estimates of recurring production costs associated with two producers involved in a competitive production effort. The model is a probabilistic rather than a deterministic model. The basic

program output provides a distribution of the total program recurring costs for an acquisition strategy of interest. Based on the simulation, the program output also provides both the mean and median estimates of the total program recurring costs, the range of those costs, and the fourth-spread values -- the values which bound the middle fifty percent of the simulated results. For multiple production periods, the cost for each period is given for each producer along with total lot cost. The program will determine which of the two producers is most likely to win a split-buy award and will display the relative win percentage. Finally, options allow cumulative probability and probability density plots to be displayed.

CDAP is based on learning-curve or cost-improvement curve theory, which states that a relationship exists between production quantity and unit price such that, as the quantity produced doubles, the unit price will be a fixed percentage less than the unit price prior to the doubling. For example, if a 95% learning curve is being observed, the cost of the 200th item will be 95% of the cost of the 100th item. The model is designed to analyze production efforts spanning several delivery years. The total program recurring costs are computed by evaluating probable costs for each year and summing the results. The result of the effort to compute the total program recurring costs, based on the cost effects of competition, depends greatly on the accuracy of the input data, all of which must be developed by the user and provided to the model. If all the parameter values were known with certainty, the alternative strategy costs could be easily computed. However, when the parameter values are not known with certainty, as is frequently the case, a range of values must be judgementally assigned to each data element, with the range reflecting the

general level of uncertainty. In the CDAP model, each factor of the basic cost relationship is treated as a triangular distribution of values with minimum, most likely, and maximum magnitudes. The model uses Monte Carlo techniques, randomly sampling from these distributions for each simulation. By repeating the process many times, the range of probable costs is developed. Figure 1 contains a listing of data elements which must be provided by the user for each acquisition strategy for the weapon system or item of interest.

1. Number of production lots to be evaluated
2. First unit cost for prime producer (minimum, expected, maximum)
3. First unit cost for the second source (minimum, expected, maximum)
4. Prime producer learning curve slope (optimistic, expected, maximum)
5. Second source learning curve slope (optimistic, expected, maximum)
6. Individual lot data
   a. Major split quantity
   b. Minor split quantity
   c. Prime producer competition shift percentage (pessimistic, expected, optimistic)
   d. Second source competition shift percentage (pessimistic, expected, optimistic)
   e. Prime producer curve competition rotation (pessimistic, expected, optimistic)
   f. Second source curve competition rotation (pessimistic, expected, optimistic)

FIGURE 1. INPUT DATA FOR THE CDAP MODEL

The development of these data element values is a labor-intensive effort and requires informed judgement on the part of the user, based on the program, the system, and empirical data. The sole source strategy values (i.e., learning-curve rate, shift, etc.) may be obtainable for a major system from the review of the Project Manager's (PM's) Baseline Cost Estimate updates, the incumbent contractor's historical data and contract negotiations. The user must also obtain the strategy values for a potential competitor in order to develop the second source input required to exercise the CDAP model. The model considers only recurring production costs and makes no automated comparisons between costs attributed to alternative acquisition strategies. Such comparisons are difficult to make since the output is a probabilistic distribution of expected production costs based on the uncertainty represented by the range of values for each of the data elements input.

c. Applicability of CDAP to Spare Parts Breakout or Competition. DoD policies and regulations require competition to "the maximum practical extent." Millions of individual transactions per year are accomplished to fill all of the orders for spares. These transactions constitute acquisitions for tens of thousands of unique parts. The sheer bulk of these transactions restricts the attention that can be given to each spare part buy.

The development of the data required by the CDAP model is a labor-intensive effort. The values for the data elements must be determined by the user based upon the particular circumstances of the item being procured and the potential competitors. Such an evaluation rests primarily on available evidence of past experience. Case-by-case analysis is required. The

input variables are highly dependent on individual program characteristics. Observations from one program cannot necessarily be extrapolated to other programs. The danger is that findings from one example will be incorrectly extrapolated to other programs with entirely different characteristics. Unfortunately, current usable data are insufficient for development of quick and easy generalizations. Even if learning curves and other required data input values were developed for classes or categories of parts, the CDAP model would not be able to differentiate between two competitors if their input data values were identical. There must be some variance in the data values for the two competitive sources, i.e., first unit cost, learning curve, etc., in order to obtain any meaningful results from the model.

In its current configuration, the CDAP model does not consider the costs incurred in obtaining competition. The strengths of the model are in its probabilistic approach to computing expected program costs for a multiple-year production program, based on learning-curve theory. The model is appropriate for use with major weapons systems and, perhaps, some major assemblies and subassemblies. Its strengths for that purpose become weaknesses when the model is considered for use as a general purpose cost analysis tool for potentially tens of thousands of spare parts analyses. The data to run the CDAP model are not readily available and require intensive effort to develop. This makes the model an impractical solution to the problem of determining whether it is cost effective to break out a given spare part to competition or to the actual manufacturer.

2. DAR Supplement 6 Economic Analysis Model

The economic analysis model prescribed by DAR Supplement 6 for the breakout decision to be reached after full screening is:

Net Savings = Estimated gross savings -
estimated cost to breakout -
possible additional costs.

The items which compose the savings and costs to be used in the model were detailed in Chapter II, page 12. It should be noted that the DAR Supplement 6 economic analysis model does not require computing the net present value of costs and benefits to take into account the time value of money. Considering the likelihood that most of the costs to break out an item will be incurred during the first year and most of the benefits will accrue in later years over the remaining life of the weapon system, present-value analysis seems to be necessary for a proper evaluation. The PMs for Spare Parts noted that much of the screening being done by most of the MSC's is limited screening. Limited screening procedures prescribed by DAR Supplement 6 do not include application of the economic analysis model.

3. Competitive Acquisition and Breakout of Spares (CABS) Model

There are some cost elements which have not been specifically identified in the DAR Supplement 6 model. For example, the cost to prepare, distribute and evaluate the solicitation and additional costs for contract administration and potential contract termination for default under the competitive acquisition process are not included. Recognizing this, the Air Force Business Research Management Center, Wright-Patterson AFB, Ohio, sponsored a study, Increasing Competition for Spares Within AFLC (Phase IV) [17], by Analytics of Dayton, Ohio, to develop a model which would capture more of the potential cost elements and to describe the state of knowledge of the magnitude of these costs.

The CABS Model was developed by Analytics "to identify and eventually quantify the cost elements relevant to the economic analysis of a decision to breakout a spare part for competitive purchase."[17:7-3] Their effort, unlike the DAR Supplement 6 model, separated the costs involved in breakout into those categories listed below:

(1) Government nonrecurring cost to break out a spare.

(2) Government recurring costs to break out a spare.

(3) Contractor nonrecurring costs to become new source (to be applied to the model only if identified and charged directly to the Government).

Estimated savings gained over the expected remaining service life of the spare part by obtaining competition are also computed for this model. To summarize the model:

Net Savings = Historical % of savings x
remaining program life buy value -
summation of nonrecurring and recurring costs associated with breakout.

The mathematical expression of the CABS model and the definitions of the cost elements are shown in Figure 2. The model includes elements which seek to quantify some of the risks involved in breakout to competitive procurement, such as the risk of nonperformance and the risk of time-delay. Like the DAR Supplement 6 model, the Analytics' model excludes present-value analysis.

$$\text{Savings} \quad (S) = S_{est}\, X_1 - \left[\sum_{i=1}^{7} Y_i + \sum_{j=1}^{8} Z_j + \sum_{k=1}^{3} U_k + \sum_{L=1}^{5} NV_l \right]$$

Recurring Cost

Z_1 = technical assistance ($)

Z_2 = product assurance ($)

Z_3 = risk of nonperformance ($)

Z_4 = risk of time-delay ($)

Z_5 = update and distribute data packages ($)

Z_6 = data package verification ($)

Z_7 = solicitation preparation & evaluation ($)

Z_8 = contract administration/termination ($)

Nonrecurring Cost

X_1 = remaining program life buy value at current unit price ($)

y_1 = cost of special tooling (government transshipment) ($)

y_2 = new source qualification ($)

y_3 = reverse engineering ($)

y_4 = initial data package verification ($)

y_5 = purchase of data rights ($)

y_6 = purchase of procurement data package ($)

y_7 = first article test and inspection ($)

u_i = production and test facilities billed to government ($)

u_2 = qualification testing billed to government ($)

u_3 = special tooling billed to government ($)

n = number of nonstandard parts in a new performance specification item (n=0 for design specification)

v_1 = variable cataloging for nonstandard part

v_2 = bid opening for nonstandard part

v_3 = management for nonstandard part

v_4 = technical data for nonstandard part

v_5 = additional repair tools and test equipment for nonstandard parts

FIGURE 2. COMPETITIVE ACQUISITION AND BREAKOUT OF SPARES (CABS) MODEL

4. Data Required to Support Models

During the interviews with field personnel and the review of literature on replenishment parts breakout, it was realized that data being used to decide whether or not to break out an item are frequently "soft." Some data required for a thorough analysis are not available. A Logistics Management Institute (LMI) study repeated the findings of a Rand Corporation report that the

> existing body of analysis has not provided an adequate set of management tools for estimating either the benefits or the costs of competitive reprocurements. . . and that much of the conventional wisdom about competitive reprocurement rests on shaky foundations, and that we may know less about competitive reprocurement than we thought we did. [20:3-12]

One of the problems the Army has in reporting savings under the SPRINT initiatives is deciding on the percentage to use when computing savings from breakout. DAR Supplement 6 allows either the 25% figure or a locally developed one to be used in computing breakout savings. Many studies have been done to quantify the amount of savings resulting from acquiring competitively items previously purchased noncompetitively with the intention that this information will serve to predict savings on future breakout actions. One of the findings in the study performed by Analytics was that the level of savings is a critical part of any economic model of the competitive spares acquisition process. They also pointed out that auditable data to provide the complete picture of costs and savings associated with competitive spares acquisition does not exist. It appears that the same assessment is appropriate for Army spares acquisition. Studies have shown individual gross unit price reductions of more than 50% as well as unit price increases of almost 30% after breakout of spare parts. The LMI

study referenced earlier reviewed several studies of this type. They warned that results of the studies should be used with caution because of sometimes faulty methodologies or data deficiencies as well as differing item characteristics which influence the level of savings. The same conclusion about the effect of differing item characteristics was also reached by Analytics when they examined data from both Warner Robins Air Logistics Center (ALC) and from Ogden ALC. The degree of variation in the average savings led them to conclude that "economic analysis of the breakout decision requires an accurate measure of the expected value of the resultant savings as well as a measure of the variability of that expected savings."[17:7-9] It must also be recognized that the data on the remaining life of the weapon system has a significant impact on the breakout decision. Not only is a reasonably accurate estimate of the remaining life necessary, a consideration of the obsolescence rate is also required. The rate at which the weapon system is being phased out will affect the proportion of the breakout savings expected to recur in each of the remaining years of life.

A Center for Naval Analysis (CNA) review of the Fleet Materiel Support Office's comprehensive report on both the costs and benefits of the Navy's Project BOSS (Buy Our Spares Smart) revealed a 22% savings on items broken out by the Navy compared to 35% savings on items broken out by Tinker ALC, the ALC with three years' experience in BOSS-type work.[26:Encl:3] A difference in the methodology for computing savings might explain some of the variation in percentages of savings; however, considering the results of other studies, it is likely some of the variation was caused by differences in the type of items being broken out. The LMI study reported

the probable competitive savings to be "a function of program characteristics -- principally the relative size of recurring and nonrecurring costs, anticipated production volumes prior to and after the introduction of competition, and the type of item being procured."[20:3-9]

Considering the implications of the breakout decision, the development of a system to collect auditable cost and benefit data appropriate to each MSC to support the breakout decision seems to be a logical step toward improving the Army's implementation of DAR Supplement 6. This system must be flexible enough to accommodate actions such as the planned contracting out of a portion of the screening process. The consequences of continuing to make breakout decisions without an adequate data base appear to justify the major effort required to develop and implement such a system.

5. Costs and Benefits of Breakout Not Contained in Models

USAAA auditors expressed concern over the potential increase in the prime contractor's overhead rates as more parts are acquired directly from subcontractors. Items such as higher overhead rates, along with the likelihood of increased lead-time and the Government's added responsibility for quality control and acceptance inspection are considered to be some of the hidden costs of breakout. Army leadership has also been concerned about possible hidden costs, particularly the potential increase in the prime contractor's overhead rates. The US Army Tank Automotive Command (TACOM) was tasked to perform a cost-effectiveness study on breakout of components to be provided as Government Furnished Material (GFM) to a prime contractor. TACOM studied five major breakout components on the Bradley Fighting Vehicle for FY's 82, 83, and 84. The prime contractor

was FMC-Ordnance Division Operation. TACOM's November 1984 report concluded that some of the Fighting Vehicle System breakout savings were offset by increases in the costs of spares and other DoD programs such as the Navy's P7.[18:2] This resulted from an increase in the G&A rate. The G&A rate increased because the breakout reduced the prime contractor's base and required distribution of total expenses over a smaller production base. FMC has a plant-wide rate and is 100% defense-oriented. Although DAR Supplement 6 does not apply to component breakout, it appears reasonable to expect similar results under some circumstances when replenishment parts are broken out.

The models described in this report do not consider the noneconomic benefits of competition. Because of the current Defense contracting environment which has resulted in a spate of legislation concerning competition in contracting, a strictly technical and economic basis for the breakout decision does not appear warranted. The current models ignore the potential for innovation resulting from competition, the need for a broader industrial base and the potential contribution to achievement of established competitive procurement goals.

B. AUTOMATED APPLICATIONS TO DAR SUPPLEMENT 6 SCREENING PROCESS

During the research to determine the feasibility of modifying CDAP for use in spare parts acquisitions, two automated applications to the DAR Supplement 6 screening process were located. These two applications are briefly described below because of their potential benefit to AMC field activities. Further investigation will be required to evaluate the costs and benefits of both applications.

1. US Army Missile Command (MICOM) DAR Supplement 6 (DARS-6) Screening Questionnaire.

MICOM is using an automated questionnaire produced by a locally-developed computer program termed a bridging program. The questionnaire is based on the full-screening process required by DAR Supplement 6. The local program extracts data from the CCSS, and produces the DARS-6 questionnaire which is organized into seven segments with questions in each segment related to a specific functional element. The data available from the CCSS is already recorded in the appropriate section of the questionnaire when it arrives in the organization responsible for initial processing. That organization will supply all additional data required from it and then pass the questionnaire to the next organization which will follow the same procedure. The process is repeated until all data are collected and evaluated. This automated questionnaire, thus completed, becomes the documentation of the breakout decision that DAR Supplement 6 requires be kept on file for each item screened.

2. VSE Corporation Computerized Drawing Review Checklist (DRCL).

During the Data Evaluation Phase of the full-screening process required by DAR Supplement 6, the adequacy of the existing technical data package is determined. VSE Corporation of Alexandria, Virginia, has developed software which is compatible with many varieties of equipment, both main frames and microcomputers, to assist an engineer in performing a review of engineering drawings.[31] The software provides a data base of approximately 1200 questions which can be selectively retrieved and used to ensure critical items are not overlooked during the drawing-review process. The data base is designed to allow the engineer to use questions appropriate

to particular drawings to verify that the item can be manufactured from the available design data. The checklist can be tailored to guide a review for adequacy of production information only or to provide additional questions relating to production costs and design considerations.

Designed to supplement an engineer's memory and professional knowledge, the DRCL system is also intended to transfer the knowledge of the experienced individuals who wrote the questions to some of the relatively inexperienced entry-level engineers who can be easily trained to operate this system. Some other benefits of the system, according to VSE Corporation, are:

a. greater uniformity in the review process even when various persons are involved in reviewing parts of a large technical data package

b. the elimination of logistics problems of inventories and revisions usually associated with preprinted checklists

c. a computer-generated list of the drawings and items checked as well as the deficiencies noted when the review is finished.

Because of the checklist, the more experienced personnel can devote more time to answering questions and reviewing problem areas on the drawing itself while less experienced personnel can be more productive sooner by performing reviews that they could not accomplish adequately without the checklist.

CHAPTER IV

CONCLUSIONS AND RECOMMENDATIONS

A. CONCLUSIONS

The Competition Decision-Assist Package (CDAP) model may be useful for some major assemblies/subassemblies where an extensive manpower effort for developing model input is warranted, but is impractical as a general purpose economic analysis model for spare parts breakout or competition.

An economic analysis model is contained in DAR Supplement 6 and constitutes a required part of the full breakout screening procedure. This model was further developed by Analytics for the Air Force in 1983. This expanded model, the Competitive Acquisition and Breakout of Spares (CABS), identifies and includes additional cost elements not contained in the DAR Supplement 6 model. Although it is likely that most of the costs to break out an item will be incurred during the first year and most of the benefits will accrue in later years over the remaining life of the weapon system, neither of these models includes present-value analysis. Further, the economic analysis of costs and savings should be accompanied by a subjective analysis which gives appropriate consideration to the noneconomic benefits of breakout or competition such as innovation and a broader industrial base.

The development of an economic analysis model for spare parts breakout or competition is not the most difficult part of accomplishing the economic analysis. The real difficulty lies in obtaining auditable data to provide the complete picture of costs, savings, and benefits associated with competitive spares acquisitions. "To be in a position to conduct an

economic evaluation of competitive reprocurement, benefits and costs must first be defined and then quantified. Both definition and quantification are so situation-specific that no one formula or savings percentage can be used universally."[20:3-8]

B. RECOMMENDATIONS

Based upon the study findings, the following are recommended:

1. Develop a system to collect auditable cost and benefit data appropriate to each MSC to support the breakout decision.

2. Employ an appropriate economic analysis model such as the CABS model or the DAR Supplement 6 model, modified to include the capability for present-value analysis, for spare parts breakout analyses pursuant to DAR Supplement 6 full-screening procedures. This model could be automated, perhaps for a microcomputer. The breakout offices at each MSC could then be provided with the software model and compatible micro, if that implementation method is adopted.

3. Consider expanding the basis for the breakout decision to include a subjective analysis of the noneconomic benefits of breakout and competition.

4. Convene periodic breakout conferences or use other appropriate media to facilitate meaningful exchanges of ideas, information, emerging methodologies and technologies pertaining to the costs, benefits, and risks of breakout and competition of spare parts. Dialogues should be held with other military departments and defense agencies concerning spare parts acquisitions. Use prior efforts as a springboard whenever possible rather than "replowing the same ground."

BIBLIOGRAPHY

1. Air Force Audit Agency. Pricing Replenishment Spare Parts, Report of Audit: Project 4040310, Norton Air Force Base, CA: Headquarters Air Force Audit Agency, 8 May 1984.

2. Army Materiel Command Acquisition and Procurement Task Force. "Acquisition and Procurement Task Force Report," Volumes I and II, Redstone Arsenal, AL: US Army Materiel Command Management Engineering Activity, 1 September 1984.

3. Bass, William K. and David J. Schmitt. An Analysis of Causes of Contract Price Change for Competitive Procurements of Replenishment Spare Parts, Thesis, Wright-Patterson Air Force Base, OH: Air Force Institute of Technology, September 1984.

4. Brost, Edward J. A Comparative Analysis of Sole Source Versus Competitive Prices in the Acquisition of Weapon System Replenishment Spare Parts, LSSR 51-82, Wright-Patterson Air Force Base, OH: Air Force Institute of Technology, October 1982.

5. Brown, Calvin. "The Nuts and Bolts of Procuring Spare Parts," Program Manager, Vol. XIII, No. 4, DSMC 61, July-August 1984, pp. 26-30 & 39.

6. Brown, Calvin. "The Nuts and Bolts of Procuring Spare Parts, (Part 2)" Program Manager, Vol XIII, No. 4, DSMC 62, September-October 1984, pp. 2-6 & 16.

7. Clark, Thomas E. PM Spare Savings Factor, Cost Memorandum 84-23, St. Louis, MO: US Army Troop Support Command, September 1984.

8. Comptroller General of the United States. "Review of the Alternate Fighter Engine Competition (GAO/NSIAD-84-104)" (Ltr to Chiles & Weicker, Senators), Washington, DC: 27 April 1984.

9. Department of Defense. DoD Replenishment Parts Breakout Program, Defense Acquisition Regulation Supplement No. 6, 1 June 1983.

10. General Accounting Office. Audit Guide for Reviewing the Feasibility of Competition on Federal Agency Sole-Source Contracts, GAO/PLRD-83-29, Washington, DC: General Accounting Office, June 1983.

11. Grinstead, Eugene A. "Holding the Line on Spare Parts Pricing," Defense Management Journal, Vol. 20, No. 3, Third Quarter 1984, pp. 9-11.

12. Hammond, Cheryl, and Greg Raffel. Variable Cost to Procure Study (DRAFT), St. Louis, MO: US Army Troop Support Command, October 1984.

13. Hayward, Daniel S. "Project BOSS: The Navy Answer to Spare Parts Pricing Problems," The Navy Supply Corps Newsletter, Vol. 47, No. 1, January/ February 1984, pp. 2-5.

14. Kratz, L.A., J.W. Drinnon, and J.R. Hiller. Establishing Competitive Production Sources, Arlington, VA: ANADAC, Inc., August 1984.

15. Lankford, V. Gail. Competition Decision-Assist Package Enhanced (CDAP-E), APRO 84-09, Fort Lee, VA: Army Procurement Research Office, October 1984.

16. Lovett, Edward T. and Monte G. Norton, Determining and Forecasting Savings from Competing Previously Sole Source/Noncompetitive Contracts, APRO 709-3, Fort Lee, VA: Army Procurement Research Office, October 1978.

17. McCann, Thomas. Increasing Competition for Spares Within AFLC (Phase IV), Dayton, OH: Analytics, December 1983.

18. Meng, Daniel H.C. and Joseph W. Pesch. Hidden Cost of Breakout, Report Number 84-14, Warren, MI: US Army Tank Automotive Command, November 1984.

19. Mullins, James P. "Spare Parts and Competition: Redressing Yesterday's Neglect," Defense Management Journal, Vol. 20, No. 3, Third Quarter 1984, pp. 3-7.

20. Myers, Myron G., Paul R. McClenon and Harry M. Tayloe. Price Competition in the DOD, Washington, DC: Logistics Management Institute, September 1982.

21. Office of Federal Procurement Policy. Review of the Spare Parts Procurement Practices of the Department of Defense, Report to the Congress, Washington, DC: Office of Federal Procurement Policy, June 1984.

22. Office of the Inspector General. Defense-Wide Audit of Procurement of Spare Parts, Audit Report, Washington, DC: Department of Defense Inspector General, 25 May 1984.

23. Olson, Alan E., James A. Cunningham and Donald J. Wilkins. A Cost-Benefit Analysis of Competitive Versus Sole-Source Procurement of Aircraft Replenishment Spare Parts, Thesis, Wright-Patterson Air Force Base, OH: Air Force Institute of Technology Air University, January 1974.

24. Pilger, James C. TSARCOM Variable Cost to Procure, Cost Memorandum 81-17, St. Louis, MO: US Army Troop Support and Aviation Materiel Readiness Command, September 1981.

25. Platt, Stuart F., interviewed by Thomas J. Gelli. "Advocating Competition in Navy Procurements," Defense Management Journal, Vol. 20, No. 3, Third Quarter 1984, pp. 13-15.

26. Sharp, Grant. "Center for Naval Analyses (CNA) Review of Project BOSS (Buy Our Spares Smart)," (Memorandum for Commander, Naval Supply Systems Command (SUP-00)), Washington, DC: Office of the Chief of Naval Operations, 22 October 1984.

27. Smith, C. H. and C. M. Lowe, Jr. Sole Source and Competitive Price Trends in Spare Parts Acquisition, Research Paper P-5, Fort Lee, VA: Army Procurement Research Office, January 1981.

28. Thompson, R.H. "Breakout," The Army Logistician, Fort Lee, VA: November-December 1979.

29. US Army Audit Agency. Acquisition of Spare Parts, US Army Materiel Development and Readiness Command, Audit Report: HQ 84-603. Alexandria, VA: Office of the Auditor General, 11 May 1984.

30. US House of Representatives. Department of Defense Appropriation Bill, 1985, Report of the Committee on Appropriations Together with Additional Views, Washington, DC: US House of Representatives, Ninety-Eighth Congress, 26 September 1984.

31. VSE Corporation. Instruction Manual for Drawing Review Checklists. Alexandria, VA: VSE Corporation, 1984.

32. Waters, Robert. "A New Verdict on Spare Parts Overcharges," Military Logistics Forum, September-October 1984.

33. Weinberger, Caspar W. "Spare Parts Acquisition," (Memorandum for the Secretaries of the Military Departments, et al.), Washington, DC: The Secretary of Defense, 29 August 1983.

34. Weinberger, Caspar W. "Spare Parts Procurement," (Memorandum for the Secretaries of the Military Departments, et al.), Washington, DC: The Secretary of Defense, 25 July 1983.

35. Williams, Robert F., William B. Williams and G. Paul Bradley. Competition Decision-Assist Package (CDAP), APRO 82-08, Fort Lee, VA: Army Procurement Research Office, September 1983.

36. Williams, William B. Guidelines for the Application of Competition, APRO 905, Fort Lee, VA: Army Procurement Research Office, June 1982.

37. Zamparelli, Steven J. Competition in The Acquisition of Replenishment Spare Parts, Masters Thesis, Wright-Patterson Air Force Base, OH: Air Force Institute of Technology, September 1983.

STUDY TEAM COMPOSITION

V. Gail Lankford, Project Officer, Operations Research Analyst, Test and Evaluation Group, Army Procurement Research Office (APRO), Fort Lee, VA. B.A., cum laude, in Mathematics, Western Maryland College, 1961. Prior to joining APRO, Ms. Lankford was an OR Analyst for five years at the US Army Logistics Center. She has also served as an Aerospace Technologist, performing scientific computer programming for NASA.

Brenda L. Stewart, Procurement Analyst, Concept Development Group, Army Procurement Research Office (APRO), Fort Lee, VA. B.S., magna cum laude, in Business Administration and Management, Virginia Commonwealth University, 1975. Prior to joining APRO, Mrs. Stewart worked for the Defense Logistics Agency as a Procurement Agent, a Logistics Systems Specialist (Procurement) and a Procurement Analyst.

APPENDIX A

ACQUISITION METHOD CODES (AMC's)

The following codes are assigned by DoD activities to describe the results of screening reviews of parts:

AMC 1. Suitable for competitive acquisition. (See Notes 1 and 2).

AMC 2. Suitable for competitive acquisition for the first time. (See Notes 1 and 2).

AMC 3. Acquire directly from the actual manufacturer, whether or not the prime contractor is the actual manufacturer.

AMC 4. Acquire, for the first time, directly from the actual manufacturer rather than the prime contractor who is not the actual manufacturer.

AMC 5. Acquire only from the prime contractor although the engineering data identifies the Federal Supply Code for Manufacturers (FSCM) and part number of a source other than the prime contractor. (See Note 3.)

Note 1: Potential sources shall include dealers/distributors.

Note 2: If sources are limited to the prime contractor and a subcontractor, a competitive code shall not be assigned unless both sources are expected to compete independently for contracts for the part.

Note 3: The DoD activity assigning this code shall furnish the name and FSCM of the prime contractor to the activity responsible for acquiring the part.

APPENDIX B

ACQUISITION METHOD SUFFIX CODES (AMSC'S)

The following codes shall be assigned by DoD activities to further describe the Acquisition Method Code:

AMSC A. The Government's rights to use data in its possession is questionable. (NOTE: This code is only applicable to parts under immediate buy requirements and only as long as rights to data are still under review for resolution and appropriate recoding.) Valid AMC's: 1, 2, 3, 4, 5.

AMSC B. Acquisition of this part is restricted to source(s) specified on "Source Control," "Altered Item" or "Selected Item" drawings/documents. Valid AMC's: 1, 2, 3, 4.

AMSC C. This part requires engineering source approval by the design control activity in order to maintain the quality of the part. An alternate source must qualify in accordance with the design control activity's procedures, as approved by the cognizant Government engineering activity. Valid AMC's: 1, 2, 3, 4.

AMSC D. (Reserved)

AMSC E. (Reserved)

AMSC F. (Reserved)

AMSC G. The Government has unlimited rights to the technical data, and the data package is complete. Valid AMC's: 1, 2.

AMSC H. The Government physically does not have in its possession sufficient, accurate or legible data to purchase this part from other than current source(s). (NOTE: This code is applicable only to parts under immediate buy requirements and only as long as the deficiency is under review for resolution and appropriate recoding.) Valid AMC's: 1, 2, 3, 4, 5.

AMSC J. (Reserved)

AMSC K. This part must be produced from class 1A castings (e.g., class 1 of MIL-C-6021) and similar type forgings. The part must be procured only from sources which use castings or forgings obtained from approved (controlled) source(s). Valid AMC's: 1, 2.

AMSC L. The annual buy value of this part falls below the screening threshold of $10,000 but it has been screened for known source(s). (NOTE: This code shall not be used when screening parts entering the inventory. It shall not be assigned in preference to or supersede any other AMSC.) Valid AMC's: 1, 2, 3, 4, 5.

AMSC M. Master or coordinated tooling is required to produce this part. This tooling is not owned by the Government or, where owned, cannot be made available to other sources. Valid AMC's: 1, 2, 3, 4.

AMSC N. This part requires special test and/or inspection facilities to determine and maintain ultra-precision quality for its function or system integrity. Substantiation and inspection of the precision or quality cannot be accomplished without such specialized test or inspection facilities. Valid AMC's: 1, 2.

AMSC P. The rights to use the data needed to purchase this part from additional sources are not owned by the Government and cannot be purchased. Valid AMC's 1, 2, 3, 4, 5.

AMSC Q. (Reserved)

AMSC R. The data or the rights to use the data needed to purchase this part from additional sources are not owned by the Government and it has been determined that it is uneconomical to purchase them. Valid AMC's: 1, 2, 3, 4, 5.

AMSC S. (Reserved)

AMSC T. Acquisition of this part is controlled by QPL procedures. Valid AMC's: 1, 2.

AMSC U. The cost to the Government to break out this part and acquire it competitively has been determined to exceed the projected savings over the life span of the part. Valid AMC's: 3, 4, 5.

AMSC V. This part has been designated a high reliability part under a formal reliability program. Probability of failure would be unacceptable from the standpoint of safety of personnel and/or equipment. The cognizant engineering activity has determined that data to define and control reliability limits cannot be obtained nor is it possible to draft adequate specifications for this purpose. Valid AMC's: 3, 4, 5.

AMSC W. (Reserved)

AMSC Y. The design of this part is unstable. Engineering, manufacturing, or performance characteristics indicate that the required design objectives have not been achieved. Major changes are contemplated because the part has a low process yield or has demonstrated marginal performance during tests or service use. These changes will render the present part obsolete and unusable in its present configuration. Limited acquisition from the present source is anticipated pending configuration changes. Valid AMC's: 3, 4, 5.

AMSC Z. (Reserved)

APPENDIX C

REPORT OF ACTIONS UNDER DoD REPLENISHMENT PARTS BREAKOUT PROGRAM

1 JUNE 1983

REPLENISHMENT PARTS ACQUISITION REPORT

Reporting Activity _____ **Fiscal Year** _____ **Period Ending** _____

Total Acquisition - Fiscal Year to Date
(Figures in Thousands)

Commodity Category	TOTAL		AMC Code 1		AMC Code 2		AMC Code 3		AMC Code 4		AMC Code 5	
	(A) No. of Parts	(B) Dollars	(C) No. of Parts	(D) Dollars	(E) No. of Parts	(F) Dollars	(G) No. of Parts	(H) Dollars	(I) No. of Parts	(J) Dollars	(K) No. of Parts	(L) Dollars
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
TOTAL												